

ART. 14. SCOLECODONTS FROM THE SHEFFIELD SHALE, UPPER DEVONIAN OF IOWA

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Professor Doctor Klaus J. Müller, Technische Universität Berlin, West Berlin, Germany, has kindly given me for description a suite of scolecodonts, fossil polychaete annelid jaws, collected and prepared by him in 1956. The specimens came from 25 feet below the top of the formation at the Sheffield type locality in the pit of the Sheffield Brick and Tile Company, just south of the town of Sheffield, Section 8, T934N, R20W, Franklin County, Iowa. The Sheffield shale is correlated with the Upper Devonian (Canadaway) of New York. Besides the scolecodonts this bed contains conodonts and casts of poorly preserved brachiopods. On the basis of the conodonts the age of the Sheffield shale may be Lower Famennian. The scolecodont fauna does not correspond to any other described material although some comparisons might be made with the Alfred, New York, forms if they were better illustrated and described.

DESCRIPTION OF SPECIES

Genus *ARABELLITES* Hinde, 1879

Arabellites demissicius sp. nov.

Maxilla I. Plate 1, Fig. 1-5, 8

The jaw is elongate and the figured specimens measure from about 0.76 mm. to 1.08 mm. in length. Along the nearly straight inner margin a series of ten large, conical, slightly backward directed denticles extends about three-quarters the length of the jaw. The fang is large and usually hooked slightly backward. The first denticle is directed forward and in most specimens follows closely the posterior edge of the fang. The next three or four denticles are large, sharp-pointed and widely spaced. These are followed by smaller denticles which gradually decrease in size posteriorly. A wide fossa occupies about one-third of the jaw. The margins of the fossa are thickened and rounded. A hooked spur-like attachment is present on the outer margin at the upper end of the fossa. The posterior end narrows to a truncation that is about half the greatest width of the jaw.

There is a resemblance between *Arabellites demissicius* and *Arabellites comis* (1938) and *Arabellites oblatius* Stauffer (1939). They differ in the general shape of the posterior end and the truncation. The shape and arrangement of the denticles are similar except for the first one. The spur of *Arabellites demissicius* seems to be more prominent and definitely hooked than the specimens of *Arabellites comis* Eller described by Stauffer (1939), Eller (1938, 1941) and Sylvester (1959).

Arabellites divaricatus sp. nov.

Maxilla I. Plate 1, Fig. 13

Anteriorly the jaw is narrowly elongate and widens abruptly at the posterior end. Only four small, conical, widely separated denticles are present on the inner margin. The fang is long, narrow, sharp-pointed and slightly hooked. The outer margin is irregularly curved ending in a blunt, spur-like projection

at the posterior extremity. A small, narrow fossa is present on the upper surface.

This form can not be compared very closely with other species of *Arabellites*. It has a spur-like projection that is similar to *Arabellites comis* Eller (1939, 1941), *Arabellites demissicius* Plate 1, Fig. 1-5, and *Arabellites duplicostatus* Plate 1, Fig. 6-7. The fossa and the number, size and arrangement of the denticles are dissimilar to other forms.

Arabellites duplicostatus sp. nov.

Maxilla I. Plate 1, Fig. 6-7

The jaw is elongate and becomes widest at the posterior end. The figured specimen measures 1.35 mm. in length. On the nearly straight inner margin a series of 13 conical, blunt to sharp, denticles extends more than three-quarters the length of the jaw. A large fang is conical, sharp-pointed and hooked backward. The next three denticles are small and blunt. These are followed by backward-directed denticles that become larger to about the mid-point and decrease gradually in size posteriorly. On the outer margin a notch occurs at about the mid-area and forms the anterior side of a large, hooked, conical shaped spur. A small shank widens the truncated posterior extremity. A deep fossa occupies more than one-third of the upper side of the jaw. Adjacent and anterior to the fossa the jaw is depressed or plicated.

This species does not seem to be too closely related to any other form. The presence of a spur suggests a similarity to *Arabellites comis* Eller (1938, 1941) and *Arabellites demissicius*, Plate 1, Fig. 1-5, 8. The denticles, the broadly truncate posterior and the large fossa place it apart from other species of this genus.

Genus NEREIDAVUS Grinnel, 1877

Nereidavus difficilis sp. nov.

Maxilla I. Plate 1, Fig. 9

The jaw is long and narrow with curved inner and outer margins. The figured specimens measure about 0.97 mm. in length. Along the inner margin a series of 10 to 12 denticles extends three-quarters the length of the jaw. The first five or six denticles are small and rounded while the remaining five or six are large, conical and sharp-pointed. The fang is broad posteriorly and tapers abruptly to a sharp-pointed extremity. A deep, narrow fossa occupies about one-third the posterior area along the outer margin of the jaw. The posterior extremity is narrow and rounded.

The denticles of *Nereidavus difficilis* are somewhat similar to *Nereidavus decoctus*, Plate 1, Fig. 11-12, but the fossa and posterior areas do not resemble each other.

Nereidavus diversus sp. nov.

Maxilla I. Plate 1, Fig. 10

Both the inner and outer margins are curved and the angle of the jaw to the horizontal shows some obliquity. The figured specimen is 0.65 mm. in length. Along the inner margin a series of 14 to 15 small, sharp-pointed denticles extends for about three-fourths the length of the jaw. The first few denticles are directed anteriorly, the next four or five perpendicular to the margin, while the remaining ones point backward. A deep, medium narrow fossa occupies the posterior quarter of the jaw. The margin of the fossa is

thickened and forms a small shank at the outer margin. The posterior extremity is narrowly truncate.

Grinnell (1877) erected the genus *Nereidavus* for Maxilla I of this type. They have been found in large numbers throughout the Paleozoic and many species have been described. Most workers have used this genus and there does not seem to be a valid reason to create a new one even though a jaw of this type may be found articulated with the remainder of the jaw apparatus. When various parts of a plant or animal are first described separately before a complete specimen is known the first name used should have priority. There is a general similarity in form and outline of *Nereidavus hamatus* (Hinde) (1882), *Nereidavus perlongus* Eller (1934), *Nereidavus harbisonae* Eller (1941), *Nereidavus paranaensis* (Lange) (1949) and *Nereidavus burgensis* (Mastinsson) (1960) to *Nereidavus diversus*. In each case the arrangement, shape and size of the denticles fail to correspond.

Nereidavus decoctus sp. nov.

Maxilla I. Plate 1, Fig. 11-12

The jaw is elongate and thick. The figured specimen measures 0.7 mm. in length. Both the inner and outer margins are curved and they terminate in a wide, truncate posterior. Along the inner margin a series of 13 or 14 conical, sharp-pointed, backward-directed denticles extends to the posterior quarter of the jaw. The first few denticles are not small but become larger at the mid-area and then decrease in size posteriorly. The fang is large, thick and hooked. A large, shallow fossa occupies about one-third of the jaw. The margin of the fossa is thickened and the upper part terminates in a small spur at the outer margin.

Nereidavus decoctus is similar to *Nereidavus distinctus*, Plate 1, Fig. 15, except for the shape, size and arrangement of the denticles.

Nereidavus digitus sp. nov.

Maxilla I. Plate 1, Fig. 14

The figured specimen is large, elongate and measures 1.95 mm. in length. The anterior end terminates in a heavy, sharp-pointed, forward-directed fang. On the inner margin a series of 12 or more very small denticles extends about to the midpoint of the jaw. They gradually decrease posteriorly to such a small size that it is difficult to detect them. The inner and outer margins are curved and the jaw has a tendency to obliquity. A very large but shallow fossa occupies about one-third the area of the jaw. The margins of the fossa are heavy, raised and rounded. At the posterior end of the inner margin a large shank curves downward and is difficult to see when the jaw is in a natural position. The posterior end is truncate.

There is a slight similarity between *Nereidavus perlongus* Eller (1934) and *Nereidavus digitus* in the arrangement and size of the fang and denticles.

Nereidavus distinctus sp. nov.

Maxilla I. Plate 1, Fig. 15

In contour the jaw is large and thick with nearly straight inner and outer margins. The figured specimen measures 1.87 mm. in length. Along the inner margin a series of 12 to 14 denticles extends about three-quarters the length

of the jaw. The last five or six denticles are minute and gradually blend into a sharp ridge posteriorly that may have been used as a cutting edge. A large, thick, angular and blunt fang is directed perpendicularly to the margins of the jaw. The fossa is large and shallow. It terminates in a truncate posterior extremity. The margins of the fossa are thickened, angular and well defined. The anterior margin is extended to a blunt spur at the outer margin of the jaw.

The gradual disappearance of the denticles to form a knife-like ridge on the inner margin has not been observed in other forms. The anterior denticles of *Nereidavus distinctus* are distinct from others of this genus.

Nereidavus muelleri sp. nov.

Maxilla I. Plate 1, Fig. 16

In outline the jaw is wide posteriorly and tapers gradually to a blunt forward and obliquely directed fang. The figured specimen measures 1.82 mm. in length. Along the inner margin a series of small, blunt, nearly uniform denticles extends just slightly beyond the midpoint of the jaw. The first two denticles are widely spaced while the posterior ones are compact. A large, deep to shallow fossa occupies about one-quarter of the posterior part of the jaw. Beginning at the middle of the fossa at the posterior end a well defined ridge continues to the anterior end to form a slightly concave and rounded spur at the outer margin. The margins of the fossa are thin and rounded.

Nereidavus muelleri does not correspond very closely to other species of this genus. It differs in shape and arrangement of the denticles and fossa.

Nereidavus disjunctus sp. nov.

Maxilla I. Plate 1, Fig. 17-18

In outline the jaw is angular especially at the truncated posterior end. The outer margin is rounded while the inner margin is nearly straight. Specimens measure as much as 1.97 mm. in length. On the inner margin a series of 10 to 16 large, rounded and low denticles extends about two-thirds the length of the jaw. When the denticles are few in number the posterior ones seem to blend gradually into the structure of the inner margin. The first five or six denticles are widely separated while the remaining ones are close together. A large angular fang is directed slightly backwards. Both denticles and fang are nearly at right angles to the lower side of the jaw. In this position they would point downward in the annelid's oral cavity. A large, angularly shaped fossa occupies the posterior end of the jaw. Beginning at the posterior end of the fossa a small rounded ridge extends diagonally toward the outer margin to about the mid-area. This structure is not reflected on the obverse side. On the under side opposite the fossa is an oval, concave area inclosed by rounded ridges. The margins of the fossa are thick and rounded, and terminate at the anterior end at the outer margin in a blunt spur the surface of which is concave when observed from the upper side. The inner margin at the posterior end is extended to form an angular shank.

The denticles of *Nereidavus disjunctus* are similar to those of *Nereidavus distinctus*, Plate 1, Fig. 15, and *Nereidavus muelleri*, Plate 1, Fig. 16, in a general way. The fossa and the very sharply truncated posterior end of *Nereidavus disjunctus* do not correspond to these structures in other species.

Genus *LEODICITES* Eller, 1940*Leodicites demissus*, sp. nov.

Maxilla II. Plate 2, Fig. 1-2, 5, 7

In shape the jaw is large, wide, subtriangular and arched. The figured specimens measure 0.6 mm. to 1.17 mm. in length. Along the curved inner margin a series of six to eight large, blunt denticles extends nearly to the acute posterior extremity. In most specimens the first denticle is small although in some specimens it is large. In mature specimens it is suggested that the first denticle has disappeared. The denticles increase to a very large size at the mid-area and decrease gradually to the posterior. The anterior margin is curved from the first denticle and becomes nearly straight to the blunt shank. From the shank to the posterior end the surface of the margin is thick and ridged. A narrow fossa extends nearly the full length of the jaw. The under side of the jaw is deeply depressed.

Most of the specimens of *Leodicites demissus* are incomplete along one margin. The denticles of *Leodicites diffusus* Eller (1946) are similar to *Leodicites demissus* in a general way.

Leodicites descriptus sp. nov.

Maxilla II. Plate 2, Fig. 13-14

The jaw is elongate, narrow and subtriangular in shape. Specimens measure from 0.80 mm. to 0.85 mm. in length. Along the nearly straight inner margin a series of 10 to 12 precisely arranged sharp-pointed, triangularly shaped denticles extends to the acute posterior extremity. Except for the first and third denticles which are small to minute the denticles are very large when compared to the width of the jaw. Except for the first one all denticles are directed backward and they decrease in size gradually to the posterior end. In some specimens the second denticle is larger than average. A slight incurved anterior margin terminates in a narrow, curved, fairly acute shank. A curved, rather deep bight is formed by the shank and the outer margin. The upper side of the jaw is convex while the under side is concave except at the posterior end where it is flattened. A deep, narrow fossa beginning in the shank extends the full length of the jaw. The margin of the fossa is slightly thickened and rounded.

The lateral margins of *Leodicites descriptus* are straighter than found in most forms. Also the jaw is long when compared to its width. *Leodicites descriptus* is similar to *Leondicites artus* Eller (1945) except for the shape and character of the denticles and shank. There is a resemblance between *Leodicites descriptus* and *Leodicites variedentatus* Eller (1940). They differ in the shape of the fossa and the arrangement of the denticles.

Leodicites declivis sp. nov.

Maxilla II. Plate 2, Fig. 18

In shape the jaw is large, wide and subtriangular. The figured specimen measures 1.72 mm. in length. Along the curved inner margin a series of 12 inclining, blunt, triangularly shaped denticles extends nearly to the pointed posterior extremity. The first two denticles are small to minute. The third denticle is a very large one and it is followed by two smaller denticles. The

remaining ones are large and decrease gradually in size posteriorly to the last two denticles which are minute. All denticles are directed backward and they tend to be close together or slightly overlap each other posteriorly. The anterior margin is rounded and becomes slightly incurved to form a pointed shank. A deep, large fossa occupies about two-thirds of the upper surface of the jaw. A thickened and rounded margin surrounds the fossa except along the inner margin where it becomes wide and flattened. The under surface of the jaw is concave while the upper surface is convex.

In shape *Leodicites declivis* resembles *Leodicites altilis* Eller (1955) very closely. They differ in the shape and width of the fossa and the arrangement of the denticles.

Leodicites divexus sp. nov.

Maxilla II. Plate 2, Fig. 19

The jaw is narrow, elongate and thick. The figured specimen measures 0.67 mm. in length and 0.27 mm. in width. Along the curved inner margin a series of 13 or 14 conical, sharp-pointed, medium-sized, backward-directed denticles extends nearly to the posterior end. The first two denticles are small and are followed by two that are large. The fifth denticle is minute and the remaining denticles are large. They decrease in size very gradually to the posterior. The anterior margin is rounded and forms a downward-sloping, sharp-pointed and hooked shank. The bight formed by the shank and the outer margin is deep and narrow. A fossa beginning in the shank extends to the wide and rounded posterior extremity. The fossa is deep and narrow. The margins of the fossa are thickened and rounded. The upper side of the jaw is highly convex while the under side is concave.

Leodicites divexus is similar to *Leodicites variedentatus* Eller (1940) in the shape of the jaw and character of the fossa. They differ in the arrangement of the denticles, the shape of the shank and width of the jaw.

Genus UNGULITES Stauffer, 1933

Ungulites dactyliformis sp. nov.

Maxilla III or IV. Plate 2, Fig. 6

The jaw is small and subrectangular in outline. The figured specimen measures 0.22 mm. in length and 0.37 mm. in width. Along the nearly straight inner margin a series of six long, conical, sharp-pointed denticles extends the full length of the jaw. The first denticle is much larger than the nearly uniform ones that follow. The outer margin is rounded and usually broken while the posterior margin is nearly straight. A large, deep fossa occupies about two-thirds of the upper side of the jaw.

Ungulites dactyliformis is similar to some of the specimens described as *Ungulites mutabilis* (Eller) (1934). It differs in the large size of the first denticle.

Genus OENONITES Hinde, 1879

Oenonites ? sp.

Maxilla II. Plate 2, Fig. 3-4, 9

Several poorly preserved or broken specimens are questionably referred to this genus. There is a slight similarity of these forms to *Oenonites triangulus* Eller (1940).

Genus PALEOENONITES Eller, 1942

Paleoenonites deltoides, sp. nov.

Maxilla II. Plate 2, Fig. 8

In shape the jaw is irregularly rectangular and the width is nearly equal to the length of the jaw. The figured specimen measures 0.45 mm. in length. Along the slightly curved inner margin a series of nine sharp, conical denticles extends nearly to the posterior end. The first deltoid-shaped denticle or fang is large, angular, and points in a forward direction while the other denticles are nearly perpendicular to the margin of the jaw. They decrease in size gradually to the posterior. The anterior margin is irregularly curved and forms a wide angle with the thin outer margin. The posterior margin is wide and forms nearly a right angle with the lateral margins. A wide, angular, shallow fossa occupies about two-thirds of the upper surface of the jaw. The margins of the upper side of the fossa are thickened and rounded.

Paleoenonites deltoides is similar to *Paleoenonites auctificus* Eller (1955). They differ especially in the angularity of the fossa and the shape of the fang.

Genus ILDRAITES Eller, 1936

Ildraites decorus, sp. nov.

Maxilla I. Plate 2, Fig. 11-12

The jaw is large, narrow, and tapers to a pointed posterior extremity. The figured specimens measure 1.07 mm. and 1.22 mm. in length. On the slightly curved inner margin a series of rather large, conical, sharp-pointed, backward-directed denticles extends the full length of the jaw. The first denticle is very large, narrow, and hooked. A very small denticle is located in the wide space between the fang and the third denticle. The remaining denticles decrease in size very slightly except at the posterior extremity where they are minute. The outer margin incurves slightly to form a narrow, acutely pointed shank. The fossa is narrow, shallow, and extends from the end of the shank to the posterior end of the jaw. The margins of the fossa are thickened and rounded.

Ildraites bowenensis Eller (1941) resembles *Ildraites decorus* except for the presence of the small denticles and the large size of the fang and the narrowness of the fossa.

Ildraites demarchus, sp. nov.

Maxilla I. Plate 2, Fig. 20-21

The jaw is large and narrowly subtriangular in shape. The figured specimen measures 1.85 mm. in length and 0.77 mm. in width. Smaller specimens are of about the same proportions. Along the inner margin a series of 12 or more, often irregularly shaped, denticles extends nearly to the acute posterior end. The first denticle or fang is heavy and in some specimens rather short. The space between the fang and the next large denticle may contain from one to three small teeth. In some specimens the first few denticles seem to be deformed into an outward growth or are represented by poorly developed denticles. The remainder of the denticles may be rounded to triangular and blunt to sharp pointed in shape. They decrease in size to the posterior end. The denticles have a tendency to be at an angle with the underside of the jaw. The outer margin incurves slightly to form a large, curved blunt shank. A shallow, crescent-shaped bight on the outer margin emphasizes the curva-

ture of the shank. A narrow, rather deep fossa is located in the posterior half of the jaw. When viewed from the upper side the area adjacent to the fossa is convex and the inner margin is extended to form an angular and broad flange. The margins of the fossa are slightly thickened and rounded. The under side of the jaw is flattened and slightly concave in the area of the shank. The upper side in the anterior end is convex at the outer margin but flattened adjacent to the denticles.

In outline *Ildraites demarchus* is similar to *Ildraites howelli* Eller (1941) but in other details there is very little likeness. *Arabellites anglicus* Hinde (1880) is somewhat like *Ildraites demarchus* except that the denticles are of a different character and the shank is not similar. *Arabellites dauphinensis* Stauffer (1933) has a fang similar to *Ildraites demarchus* but the denticles and shank do not correspond.

Genus MARPHYSAITES Eller, 1945

Marphysaites deliguus, sp. nov.

Carrier. Plate 2, Fig. 10

The carrier is very large and the figured specimen is estimated to be 1.1 mm. in length. The thickened anterior margin is straight and terminates in a notch at the outer margin. Just adjacent to the outer margin at the anterior end the carrier is concave but becomes slightly convex posteriorly. The inner margin incurves slightly at the anterior end and then curves broadly outward. The outer margin is incurved. The carrier probably narrows gradually to an acute posterior extremity which is lacking.

The only specimens that this carrier might support are those described under the genus *Nereidavus*. As far as can be determined the carriers of recent species of this type have straight inner margins that are joined. Based on the mandibles of the modern genus *Marphysa* and since all fossil articulated specimens known at that time, Hinde (1896), Eller (1934, v. 22) and Eller (1934, v. 24), show articulation along the inner margin, the form *Maryphysaites aptus* Eller (1945) was described as a mandible. Lange (1949), however, found carriers that belong to *Nereidavus paranaensis* (Lange) that are joined only at the anterior end. Thus *marphysaites deliguus* is described as a carrier and not as a mandible.

Genus DIOPATRAITES Eller, 1938

Diopatraites dichotomus, sp. nov.

Mandible. Plate 2, Fig. 16

The mandible is narrow, elongate and straight. The figured specimen measures 0.9 mm. in length. The frontal plate is small, convex, and subrectangular in shape. A small notch is present on the rounded anterior end. The posterior margin of the frontal plate is rounded and notched. A groove extends between the two notches dividing the plate into two parts. The inner section of the plate is larger and more convex than the outer area. The surface of the outer side of the plate is irregularly grooved and the margin is angular. Faint striations ornament the surface. The shaft is long and tapers gradually from the frontal plate to an acute posterior extremity. The upper side of the shaft is convex while the under side is concave.

Diopatraites dichotomus resembles other species only in a general way. The frontal plate is dissimilar.

Diopatraites digonus, sp. nov.

Mandible. Plate 2, Fig. 17

The mandible is narrowly elongate and the figured specimen measures 0.7 mm. in length. The frontal plate is small, convex and two-cornered or subrectangular in shape. The anterior end is angular and terminates in an acute extremity or tooth while the posterior end of the plate is rounded. Very fine striations follow the margins and contours of the plate. The shaft is long and the sides are parallel to about the midpoint where they taper to an acute posterior extremity. The upper surface of the shaft is slightly flattened or concave at the margins. The under side is highly concave.

The shape of the shaft and anterior end of the frontal plate make *Diopatraites digonus* different from other species.

Genus *SILUROPelta* Eisenack, 1939

Siluropelta dejectus, sp. nov.

Carrier. Plate 2, Fig. 15

The carrier is wide and the figured specimen, although broken, measures about 0.57 mm. in length and 0.30 mm. in width. The straight inner margin is wide and thick. It incurves slightly anteriorly and continues to form an angular shaft. Part of the shaft is missing. The area adjacent to the shaft and inner margin is sunken or concave while the area at the outer margin is convex. The outer margin is well rounded to the truncate posterior.

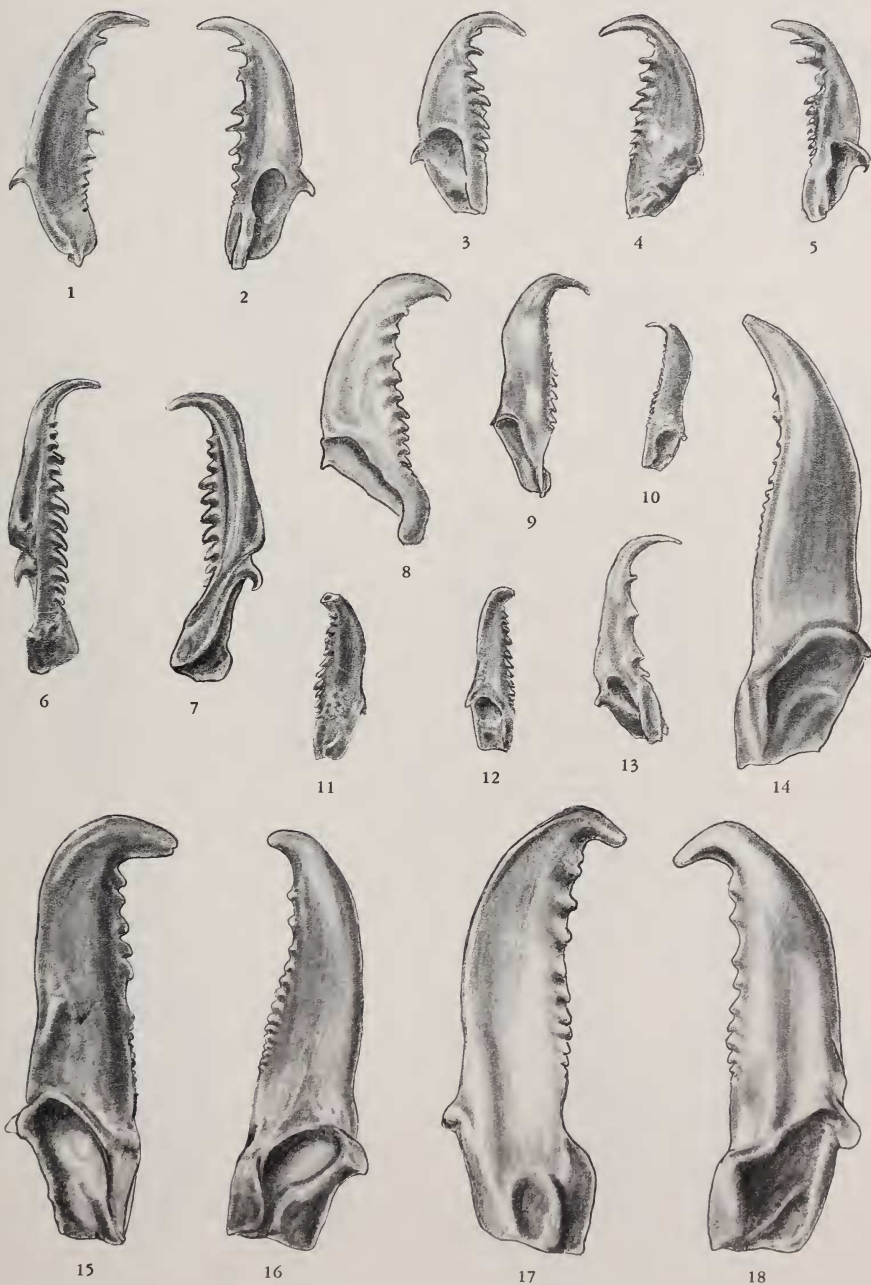
Eller (1945) described *Siluropelta calcaratus* as a mandible and not as a carrier since it did not seem possible for a specimen with a long thin shaft or spur to fit into the upper part of the oral cavity. Eisenack (1934) described similar forms as carriers. The mandibles of a recent species, *Paramarphysa obtusa* Verrill do have long spines or shafts. Based on recent Polychaete genera, *Stauroneries*, *Arabella*, *Agaurides*, *Diopatra*, *Leodice*, *Onuphis* and others, Eller (1946) reversed the orientation so that the shaft would point backward. Kozłowski (1956), however, figured forms of this sort as carriers (supports) having the shafts pointing forward in articulation with the jaw apparatus.

EXPLANATION OF PLATE 1

Figures magnified about 28 times.

Numbers in parenthesis indicate Carnegie Museum catalogue numbers of the respective type specimens.

- Fig. 1-2. *Arabellites demissicius* sp. nov.
Maxilla I, right jaw (28619).
Under and upper sides.
- Fig. 3-4. *Arabellites demissicius* sp. nov.
Maxilla I, left jaw (28621).
Under and upper sides.
- Fig. 5. *Arabellites demissicius* sp. nov.
Maxilla I, right jaw (28624).
Upper side.
- Fig. 8. *Arabellites demissicius* sp. nov.
Maxilla I, left jaw (28626).
Upper side.
- Fig. 6-7. *Arabellites duplicostatus* sp. nov.
Maxilla I, left jaw (28627).
Lateral sides.
- Fig. 13. *Arabellites divaricatus* sp. nov.
Maxilla I, left jaw (28628).
Upper side.
- Fig. 9. *Nereidavus difficilis* sp. nov.
Maxilla I, left jaw (28631).
Upper side.
- Fig. 10. *Nereidavus diversus* sp. nov.
Maxilla I, right jaw (28634).
Upper side.
- Fig. 11-12. *Nereidavus decoctus* sp. nov.
Maxilla I, left jaw (28637).
Under and upper sides.
- Fig. 14. *Nereidavus digitus* sp. nov.
Maxilla I, right jaw (28639).
Upper side.
- Fig. 15. *Nereidavus distinctus* sp. nov.
Maxilla I, left jaw (28643).
Upper side.
- Fig. 16. *Nereidavus muelleri* sp. nov.
Maxilla I, right jaw (28650).
Upper side.
- Fig. 17-18. *Nereidavus disjunctus* sp. nov.
Maxilla I, right jaw (28651).
Under and upper sides.

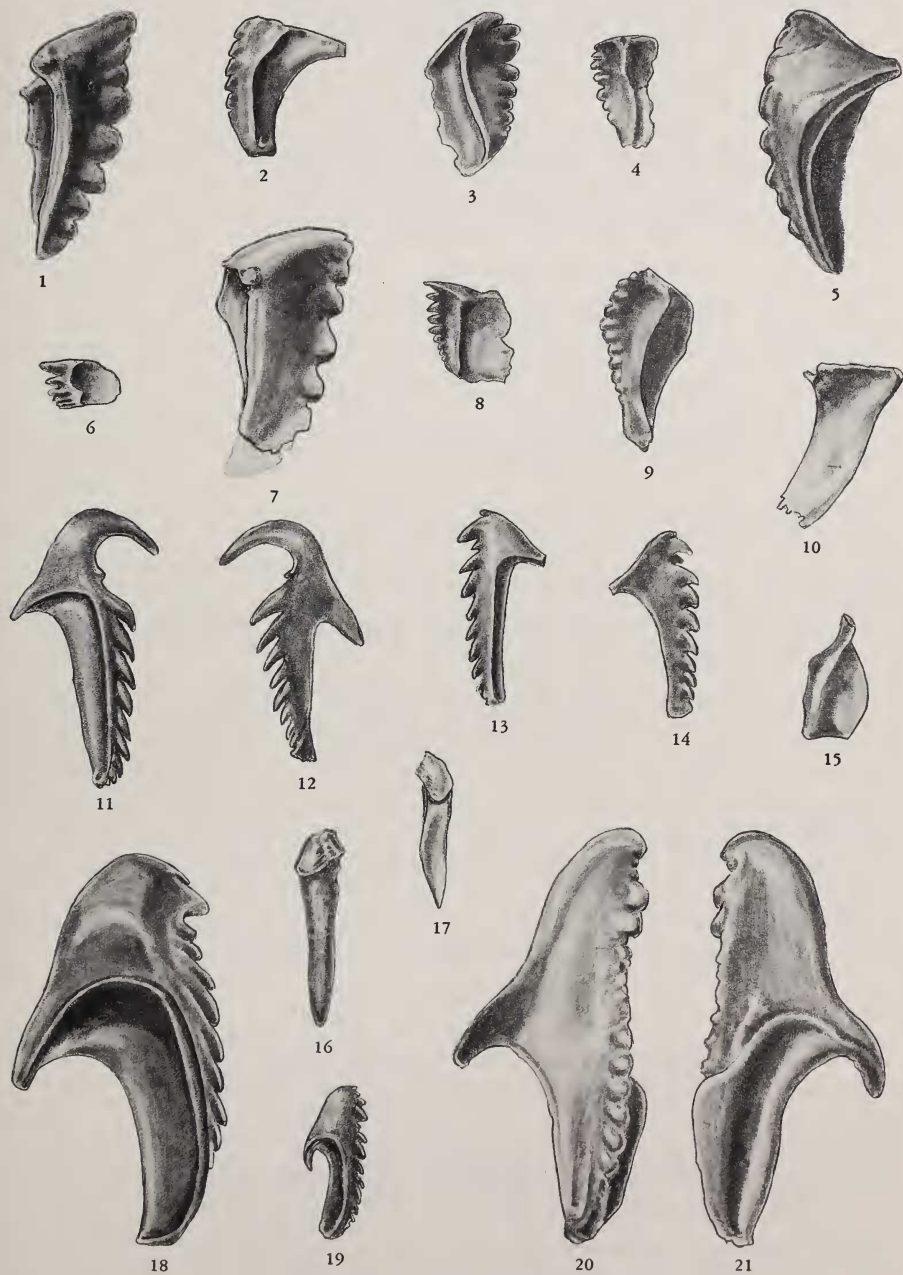


EXPLANATION OF PLATE 2

Figures magnified about 28 times.

Numbers in parenthesis indicate Carnegie Museum catalogue numbers of the respective type specimens.

- Fig. 1, 5. *Leodicites demissus* sp. nov.
Maxilla II, right jaw (28657).
Under and upper sides.
- Fig. 2. *Leodicites demissus* sp. nov.
Maxilla II, right jaw (28658).
Upper side.
- Fig. 7. *Leodicites demissus* sp. nov.
Maxilla II, right jaw (28659).
Under side.
- Fig. 13-14. *Leodicites descriptus* sp. nov.
Maxilla II, right jaw (28666).
Upper and under sides.
- Fig. 18. *Leodicites declivis* sp. nov.
Maxilla II, left jaw (28671).
Upper side.
- Fig. 19. *Leodicites divexus* sp. nov.
Maxilla II, left jaw (28678).
Upper side.
- Fig. 6. *Ungulites dactyliformis* sp. nov.
Maxilla II or IV, right jaw (28681).
Upper side.
- Fig. 3. *Oeononites* ? sp.
Maxilla II, left jaw (28682).
Upper side.
- Fig. 4. *Oeononites* ? sp.
Maxilla II, right jaw (28683).
Upper side.
- Fig. 9. *Oeononites* ? sp.
Maxilla II, right jaw (28684).
Upper side.
- Fig. 8. *Paleoeononites deltoides* sp. nov.
Maxilla II, right jaw (28688).
Upper side.
- Fig. 11. *Ildraites decorus* sp. nov.
Maxilla I, left jaw (28691).
Upper side.
- Fig. 12. *Ildraites decorus* sp. nov.
Maxilla I, left jaw (28691).
Under side.
- Fig. 20-21. *Ildraites demarchus* sp. nov.
Maxilla I, right jaw (28692).
Under and upper sides.
- Fig. 10. *Marphysaites deliguus* sp. nov.
Carrier. (28699).
Upper side.
- Fig. 15. *Siluropelta dejectus* sp. nov.
Carrier. (28704).
Under side.
- Fig. 16. *Diopatraites dichotomus* sp. nov.
Mandible, left shaft (28700).
Upper side.
- Fig. 17. *Diopatraites digonus* sp. nov.
Mandible, right shaft (28701).
Upper side.



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